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FURTHER REPORT ON THE NASTIN TREATMENT OF LEPROSY CARRIED OUT
AT THE LEPER ASYLUM, MAHAICA, BRITISH GUIANA, FROM SEPTEMBER
1910 TO SEPTEMBER 1911.

By E. P. MINETT, M.D., &c.,
ASSISTANT GOVERNMENT BACTERIOLOGIST, BRITISH GUIANA.

PART I.

SINCE September 1910 this treatment has been carried out on the same lines
as before, a few minor modifications only being introduced.

Of the 24 cases selected 18 were under treatment with nastin for practi-
cally two years, the remaining 6 cases were under treatment for periods
ranging from six to nine months.

In September 1910 all these cases were transferred from treatment with
nastin only to treatment with a solution of benzoyl chloride.

Results of the 24 cases treated first with nastin and later with benzoyl
chloride:—

Males	19
Females	5
	—
	24

Race.

	Males.	Females.	
Black.....	12	4	
E. Indian	2	0	
Coloured	2	1	
Portuguese	1	0	
White	2	0	
	—	—	
	19	5	Total 24.

Country of Origin.

	Males.	Females.	
British Guiana.....	14	5	
Barbadoes.....	3	0	
India.....	2	0	
	—	—	
	19	5	Total 24.

Age Incidence.

	Males.	Females.	
10 to 20 years	7	3	
20 to 30 „	5	2	
30 to 40 „	7	0	
	—	—	
	19	5	Total 24.

Approximate Duration of Disease when Treatment started.

	Males.	Females.
1 year and under.....	9	3
1 to 3 years	5	1
3 years and over	5	1
	19	5
	Total 24.	

Duration of Treatment.

	N.		B. C.	
	M.	F.	M.	F.
Under 1 year	6	0	9	3
1 year and over	13	5	10	2
	19	5	19	5
	Totals 24.			

Presence or Absence of Bacilli, with Estimation of Numbers Present at End of Period of Observation.

	Males.	Females.
Many Bacilli	10	3
Few Bacilli	5	1
No Bacilli.....	4	1
	19	5
	Total 24.	

Amount of Destruction of Bacilli observed.

	Males.	Females.
No destruction	3	0
75 % „	7	0
50 % „	2	1
25 % „	3	3
No bacilli.....	4	1
	19	5
	Total 24.	

Type of Cases.

	Males.	Females.
Nodular	9	2
Anæsthetic	4	3
Mixed	6	0
	19	5
	Total 24.	

Presence or Absence of Ulcers.

	Present.	Absent.
Males.....	13	6
Females.....	3	2
	16	8
	Total 24.	

Cases in which Eye-Lesions were Present.

	Present.	Absent.
Males.....	1	18
Females.....	1	4
	2	22
	Total 24.	

Classification of Results after Treatment.

	Males.	Females.
Improved	4	1
Doubtful	8	2
Worse	7	2
Died	0	0
	19	5
		Total 24.

Careful clinical notes were taken at regular intervals of the condition of the patients under treatment.

A microscopical examination was also made frequently and the findings noted under the date when the specimens were taken.

The numbers of bacilli present were estimated by the general characters of each slide in conjunction with the numbers of bacilli observed in several fields. As the whole of the estimations were made by the same observer they may, I think, be taken to be approximately correct.

The amount of so-called destruction of bacilli was estimated by observing the number of bacilli showing plasmolysis in a constant total, the estimation being the work of the same observer in all cases in order to ensure uniformity of results.

The results of this treatment will be discussed later in the report.

PART II.

Report on 71 Cases treated with Benzoyl Chloride.

No attempt was made to select these cases, the patients being taken under treatment as they presented themselves.

The treatment consisted in intramuscular injections of a 5 per cent. solution of benzoyl chloride in sterilised heavy petroleum oil (white oleum petrolatum). This was used in preference to an animal or vegetable oil owing to its freedom from water, as many of the former contain a considerable amount of water and cause a rapid decomposition of the benzoyl chloride.

This decomposition does not take place in a mineral oil, which also has the additional advantage in that it does not become rancid if exposed to the air.

In addition to the injections a 2½ per cent. solution of benzoyl chloride in oleum petrolatum was used weekly as a nasal spray, and ulcers and broken-down nodules were painted with this preparation.

The following are the results of these 71 cases in tabulated form :—

*Total number of Cases treated 71.**Sex Distribution.*

Males	46
Females	25
	71

Country of Origin.

	Males.	Females.	
British Guiana.....	22	18	
India	20	4	
Barbadoes.....	3	2	
Africa	1	0	
Madeira.....	0	1	
	46	25	Total 71.

Race Incidence.

	Males.	Females.	
Black.....	19	15	
East Indian	23	5	
Mixed	2	1	
White	0	1	
Portuguese	2	3	
	46	25	Total 71.

Age Incidence.

	Males.	Females.	
10 to 20 years	8	5	
20 to 30 „	12	7	
30 to 40 „	13	5	
40 to 60 „	13	8	
	46	25	Total 71.

Approximate Duration of the Disease when first treated.

	Males.	Females.	
Under 6 months	13	10	
6 months to 1 year	12	6	
1 year to 3 years	9	3	
3 years to 5 years.....	4	1	
Over 5 years.....	8	5	
	46	25	Total 71.

Length of Treatment.

	Males.	Females.	
Under 6 months	1	2	
1 year and over	45	23	
	46	25	Total 71.

Presence or Absence of Bacilli (at end of experiment).

	Males.	Females.	
Many bacilli	20	6	
Few bacilli	5	6	
No bacilli	16	10	
Irregular cases	5	3	
	46	25	Total 71.

Destruction of Bacilli observed.

	Males.	Females.	
No destruction.....	2	1	
75 % „	10	1	
50 % „	5	3	
25 % „	5	4	
No bacilli present	24	16	
	46	25	Total 71.

Type of Cases.

	Males.	Females.	
Nodular	16	9	
Anæsthetic	25	14	
Mixed	5	2	
	46	25	Total 71.

Presence or Absence of Ulcers.

	Males.	Females.	
Present	26	16	
Absent	20	9	
	46	25	Total 71.

Presence of Eye-Lesions.

Males.....	2
Females.....	3
Total 5 Cases.	

Classification of Results.

	Males.	Females.	
Improved	18	7	
Worse	9	4	
Doubtful	19	11	
Died	0	3	
	46	25	Total 71.

Comparison between 24 cases treated with natin, 71 cases treated with benzoyl chloride, and 8 cases that had received no treatment of any description, beyond removal to better conditions as regards food, cleanliness, &c., as obtained in the Asylum in comparison with their former conditions of poverty :—

Expressed as percentages of each total.

	Natin. per cent.	Benzoyl Chloride. per cent.
Improved	21	36
Doubtful	42	42
Worse	37	19
Died	0	3
Bacilli still present	79	52
Ulcers present	41	59
Eye-lesions	8	7

PART III.

Eight untreated cases were examined regularly as confirmatory evidence that anæsthetic leprosy tends to self cure ; the following shows briefly their classification :—

Patients considered as non-infective that have never been treated in any way.

Total number..... 8. All males.

Country of Origin.

British Guiana	7
India.....	1
Total	8

Duration of Disease.

5 years	1
5 to 10 years	3
10 to 20 years	4
Total	8

Race Incidence.

Black	7
East Indian	1
Total	8

Age Incidence.

20 to 30 years	2
30 to 40 „	2
40 to 50 „	2
50 to 60 „	2
Total	8

Type of Disease.

Anæsthetic	6
Mixed	2
Nodular	0
Total	8

All show continued absence of bacilli.

Two show no ulcers, 6 have small ulcers.

Six show signs of decided improvement. Although contractions and amputations are present they appear no longer infective.

With regard to the plasmolysis or so-called destruction of bacilli, it has been before stated that this is a natural process and can be observed in untreated lepers. There appears to be no doubt that this view is a correct one, as after making careful notes of many cases in various stages of the

disease, all of them untreated, it can be shown that the degree of destruction is totally unreliable as an index of the progress of treatment. Apparently the damaged appearance of the bacilli is merely the effect on them of a local tissue reaction, probably a partial phagocytosis or a bacteriolysis ; it varies from time to time and also in different situations in the same patient.

The following are the results of twelve cases examined periodically before any treatment was started. They were recorded for the purpose of having control cases to compare with the amount of destruction observed in the cases treated with nastin and benzoyl chloride. The amount of destruction was estimated in an exactly similar manner in all cases.

PART IV.

Untreated Cases.

Analysis of 12 cases examined before treatment of any kind was commenced.

Presence or Absence of Bacilli.

Many bacilli	8
Few bacilli	4
Total	12

Amount of Destruction of Bacilli observed.

75 % destruction	5
50 % "	2
25 % "	3
Destruction not estimated	2
Total	12

GENERAL REMARKS.

As regards the clinical observations the general effect was that the patients seemed brighter, and the Medical Superintendent stated that they worked with a better will. This effect was equally well marked whether the cases were treated with nastin or benzoyl chloride.

I am of opinion that the improvement is almost entirely due to their improved mental condition ; but whether entirely so it is difficult to say.

Marked physical improvement nearly always follows removal from conditions of poverty and filth to a well-ordered Asylum, irrespective of any treatment, and an improvement can be readily understood in the mental attitude of an impressionable race, such as form the bulk of our cases, when hope and interest are excited by a new treatment.

For example, by comparisons made between many cases which have shown signs of improvement since admission to the Asylum, it appears that the improvement made is the same in untreated cases as in those under treatment.

There is no doubt that leprosy is a disease of exceptional obstinacy, and also that its clinical and bacteriological conditions vary greatly from time to time quite independent of any treatment. The length of time during which these cases have been treated of itself introduces such an element of doubt

that it is unfair to ascribe the small amount of improvement made to treatment, but rather to the general tendency of the disease towards a natural recovery.

Besides, were the nastin treatment possessed of any marked influence on the course of the disease, the larger number of cases which get progressively worse as compared with those showing improvement, in my opinion more than negatives any claim to a beneficial effect, especially when the decided improvement in the eight untreated cases is considered.

Careful clinical and bacteriological examinations made during and after practically two years' treatment, show, in a few cases only, certain changes towards improvement, but these changes are too slight to give any hope of recovery.

With regard to benzoyl chloride, its use as a nasal spray is of very great value: cases in which large numbers of leprosy bacilli were shown to be present in the nasal mucous membrane rapidly lost all traces of bacilli under the use of a $2\frac{1}{2}$ per cent. solution.

On broken-down nodules and ulcerating surfaces in which enormous numbers of bacilli were present it caused a rapid disintegration and destruction of bacilli.

Its subcutaneous injection seems to be of very doubtful utility.

In comparing the relative number of cases showing apparent improvement under benzoyl chloride with those treated with nastin, it must, however, be borne in mind that the patients treated with nastin contained a larger percentage of nodular cases than those treated with benzoyl chloride, the numbers being 45 per cent. for nastin and 35 per cent. for benzoyl chloride, a difference of 10 per cent.

Therefore, as the cases treated with benzoyl chloride show a 15 per cent. larger number of cases showing an apparent improvement over those treated with nastin, it would appear that the ratio of improvement should read as nearly equal, with a small margin of 5 per cent. in favour of the benzoyl chloride.

I beg to tender my thanks to the Medical Superintendent at the Leper Asylum for the assistance in carrying out these investigations.

CONCLUSIONS.

1. That nastin has apparently very little beneficial effect on cases of leprosy.
2. A solution of benzoyl chloride in oil shows a slightly higher percentage of improvement than nastin.
3. Anæsthetic cases of leprosy run a definite course, after which the disease seems to die out, leaving the patient no longer infective.
4. These cases recover sensation after a time in areas previously anæsthetic, and after self-amputation only scars remain.

This is a natural process and takes place without any treatment whatever; it is not apparently influenced by either nastin or benzoyl chloride.

5. Nodular cases do not tend to improve naturally as above, except in very rare instances; nor do they appear to be affected appreciably by either nastin or benzoyl chloride.
6. The so-called destruction of bacilli is a natural process varying considerably, and does not appear to be influenced by nastin or benzoyl chloride.

7. The variations of the amount of destruction of bacilli observed are of limited value as an indication of the effects of treatment.
8. Benzoyl chloride in petroleum oil is extremely valuable as a nasal spray or a paint for ulcerating surfaces. It quickly renders the discharge free from the presence of bacilli.
9. Its regular use for this purpose is strongly recommended in Leper Asylums.



